

Patent Claims

- 1 Method for data maintenance in an offline-  
distributed database network system (DBNS) which  
5 comprises a central system (CS) having a central  
database (CD), and a number of node systems (NS)  
having local databases (LD), with  
the local databases (LD) at least in some cases  
containing different subsets of the data from the  
10 central database (CD),  
change information relating to the data stored in  
the databases (CD, LD) in the database network  
system (DBNS) being recorded in a number of node  
systems (NS),  
15 the change information for an existing online  
connection being transmitted as replication  
objects, which are structured in a number of  
different types and contain an identification key,  
from the node systems to the central system or  
20 from the central system to the node systems,  
if there is no online connection, the replication  
objects being prepared, in an outbound queue, for  
subsequent transmission,  
the replication objects together with the change  
25 information being allocated as responsibilities to the  
node systems (NS) to which they are intended to be  
transmitted by means of at least one lookup table  
(LUT) in a replication algorithm in the central  
system (CS), and the at least one lookup table  
30 being updated, in a realignment algorithm, taking  
account of the change information.
2. Method according to Claim 1, in which the  
replication objects form a breakdown of all the  
35 data sets which are public between the databases  
(CD, LD) in the database network system (DBNS).
3. Method according to one of Claims 1 or 2, in which  
the replication objects contain an identification

of their type and identification of the database operation update, insert or delete, which corresponds to the change information coded in the replication object.

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4. Method according to one of the preceding claims, in which the processing of the replication objects in the central system (CS) is controlled by means of a flow controller (FC) in accordance with a
- 10 flow definition (FD) which is specific for the type of replication object.
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5. Method according to one of the preceding claims, in which remote calls (qRFC) are used for transmitting change information from the central system (CS) to the node systems (NS) and are designed such that common data items which are required for a number of calls in an outbound queue need be stored only once.
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6. Method according to one of the preceding claims, in which at least two types of lookup tables are used, of which a first type (B-LUT) contains an allocation between types of replication objects and the responsables, and a second type (O-LUT) contains an allocation between entities of
- 25 replication objects and the responsables.
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7. Method according to Claim 6, in which a number of lookup tables of the second type (O-LUT) are used, which each contain allocations between the entities of a replication object type and the responsables of the entities.
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8. Method according to one of Claims 6 or 7, in which different types of replication algorithms are carried out depending on the type of replication object, with

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9. Method according to Claim 8, in which a third replication algorithm type (dependent replication) is used to allocate a specific third subset as replication objects, which does not overlap the first or the second subset, to the responsible as a function of the allocation entered for a higher-level replication object in a lookup table of the second type (O-LUT).
10. Method according to one of the preceding claims, in which the realignment algorithm is carried out independently of the replication algorithm, and asynchronously with respect to it.
11. Method according to one of Claims 3 to 10, in which a job for the realignment algorithm is generated in the replication algorithm on the basis of a check (703) of the identification of the database operation, if the database operation which corresponds to the change information coded in the processed replication object is an insertion or a deletion.
12. Method according to one of Claims 3 to 10, in which a job for the realignment algorithm is generated in the replication algorithm on the basis of a check (703, 706) of the identification

- of the database operation, if the database operation which corresponds to the change information coded in the processed replication object is a modification (update), and the data in at least one predetermined distribution-critical data field of the replication object have been changed.
13. Method according to Claims 8 and 11 or 12, in which the check (703) of the identification of the database operation is carried out in the course of the second replication algorithm type (intelligent replication).
14. Method according to one of Claims 10 to 13, in which, in the realignment algorithm, the contents of the distribution-critical data field are compared with distribution rules which are predetermined in a subscription table ST, and the lookup table (O-LUT) is updated on the basis of this comparison.
15. Method according to one of Claims 10 to 14, in which, in the realignment algorithm, a lookup table for a replication object (O-LUT) is updated taking account of the lookup table (SRO-LUT) for a higher-level replication object.
16. Method according to one of Claims 10 to 15, in which, in the realignment algorithm, all the responsables who are up-to-date taking account of the change information coded in the replication object are first of all determined, these responsables are compared with the responsables listed in a lookup table (O-LUT) in order to determine additional new responsables and ex-responsables who are no longer up-to-date, and the information about the new responsables and the ex-

responsibles is provided for transfer to the lookup table (O-LUT).

17. Method according to Claim 16, in which, in the  
5 realignment algorithm, once the new responsables  
and the ex-responsibles have been determined, the  
necessary insert operations for the new  
responsibles and delete operations for the ex-  
responsibles are initiated, by means of which the  
10 complete data contents of the replication object  
processed in the realignment algorithm are  
transmitted to the new responsables, and the data  
contents which correspond to the replication  
object are deleted in the databases of the ex-  
15 responsables.
18. Method according to Claim 17, in which the  
necessary insert or delete operations are  
initiated by means of a separate extract  
20 algorithm, which runs independently of the  
realignment algorithm and asynchronously with  
respect to it, in which replication objects are  
produced which are transmitted to the new  
responsibles in order to carry out the insert  
25 operation, and to the ex-responsibles in order to  
carry out the delete operations.
19. Method according to one of Claims 17 or 18, in  
which the new responsables and the ex-responsibles  
30 are not transferred to the lookup table (LUT)  
until assurance has been obtained that the  
necessary insert or delete operations have been  
carried out, before the changed lookup table is  
accessed for the first time in a replication  
35 algorithm.
20. Method according to one of the preceding claims,  
in which clusters of replication objects which are  
linked to one another are formed in order to take

account of links, which are coded in the replication objects, to other replication objects in the realignment algorithm, for which clusters all those responsables who are up-to-date taking  
5 account of the change information coded in the replication object are first of all determined in a for-loop, these up-to-date responsables are compared with the responsables listed in a lookup table (O-LUT) in order to determine any additional  
10 new responsables and ex-responsables who are no longer up-to-date and the information about the new responsables and the ex-responsables for all the replication objects in the cluster is provided for transfer to the lookup table (O-LUT) after  
15 completion of the for-loop.

21. Method according to one of the preceding claims, in which the replication objects are identified by keys which are unique throughout the entire  
20 database network system.

22. Computer program product, which can be loaded directly into the memory of a digital computer and which comprises software code sections using which  
25 the steps of the method according to one of Claims 1 to 20 are carried out when the product is running on a computer.

23. Computer-compatible memory medium having a  
30 computer program product according to Claim 22.

24. Database network system containing a computer program product according to Claim 22.